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SIS2000+ User Guide

Using the Master Schedule Builder Assistant

Contents

Using the Master Builder

Introduction

The SIS2000+ Master Schedule Builder Assistant (also called the Master Builder or Assistant) is a school administrator's tool for assisting in the creation of master schedules for middle and high schools.

In simplest terms, the design of a master schedule will be determined by reconciling two important factors: student course requests vs. resources (such as faculty availability, classrooms, etc.). Following this, the goal is to accommodate the greatest number of course requests with the least number of scheduling conflicts and best overall schedule balance while adhering as closely as possible to the planned curriculum.

When a suitable master schedule is completed using the Master Builder, it is then exported to the Master Schedule application. In fact, several versions of a master schedule can be saved for trial scenarios. The next step is to schedule the students into the classes in a master schedule using the Student Schedule Loader application.

The primary component of the Master Builder application is the **Assistant** screen where the user can use the computer to build the master schedule, much like the traditional "white board" approach. Although difficult to create this metaphor with a computer program, the **Assistant** component of the Master Builder comes as close to it as possible, thus offering the user a method that is intuitive like the white board, yet has the all the advantages of advanced computer technology.

Getting Started

Step 1- Prerequisites

The following procedural steps in SIS2000+ must be completed prior to beginning the process of building a master schedule:

1. Run the New Year Initialization procedure to create future tracks. It is recommended that you copy the Master Schedule during the Initialization process. (In previous versions of SIS2000+ this was *not* recommended, but with the advent of the Master Builder the old master schedule can now be archived for safe keeping. This process will be explained in later sections of this document.)
2. Complete track setup for the future tracks created, i.e. set begin & end dates, add term & month markers, add Bell Schedule (may copy Bell Schedule)
3. If new courses are added for the new year, be sure they are assigned to their target tracks in the Track Course Selection application.
4. In the District Courses application, set the **Section Size** to an appropriate default value for each course.
5. If new faculty are added, they need active status in the new track.
6. Student course requests must be entered into the system, reviewed by counselors and parents, cleaned up and approved.

7. As you know, when using the link section function, the student requests only the root course. However, a block of time representing all courses involved in the link must be available to the Master Schedule Builder Assistant. Therefore, you will:

   a. Schedule the root courses to envelop the total time of the linked block of time.

   b. Build the master schedule.

   c. Export the master.

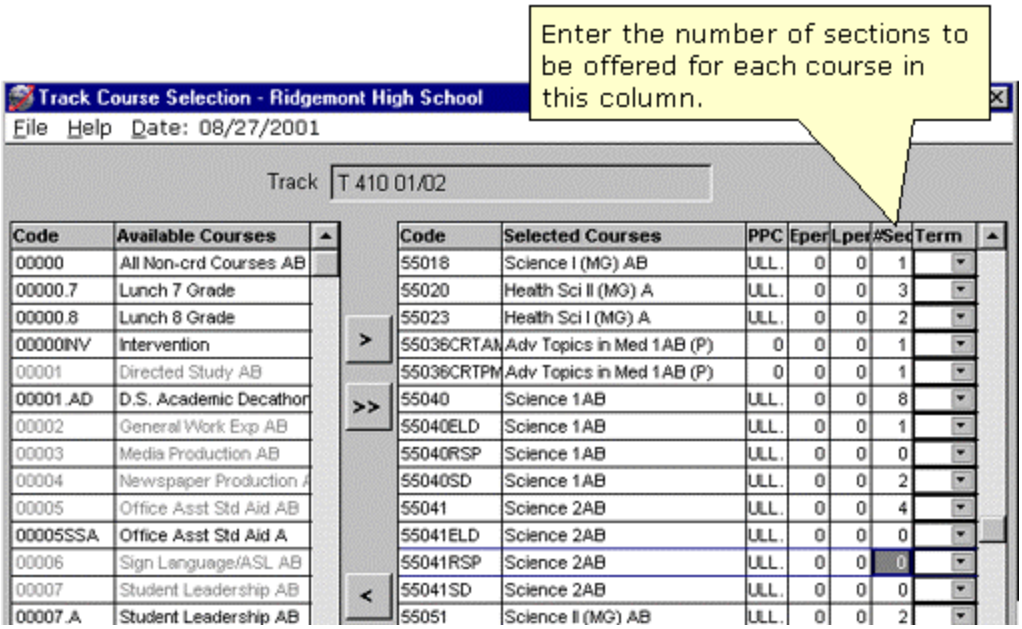
   d. Run the Loader.

   e. Set links and re-run Loader.

Step 2 - Define number of course sections:

School administrators must decide on the number of course sections that will be offered for each course in the new master schedule. This is determined by comparing the number of course requests for each course to your staffing allocations and other resources. These values must be defined in the **Track Course Selection** application before a master schedule can be built. The values must be accurate and up to date in order for the Master Builder to work properly.

1. Print Course Request List & Tally Report. Use this report as basis to calculate the number of sections needed for each course.
2. Log on to the target school and track. Open the Track Course Selection application (Main Menu > System > System Setup > School Setup > Course Selection) and enter into the system the number of sections needed for each course in the track.



3. For convenience, you may want to enter the following information on the Tally Report and utilize it as a resource during the build process:

   ?? The number of sections assigned for each course
   ?? Course Duration for each course (semester, all year, etc.)
   ?? Number of Days in the Cycle each course meets

Step 3 - Gather resources information

Resources are the number of teachers and rooms available plus their constraints (such as teacher availability, skills, preferences, room use restrictions, etc.)

1. Gather Room constraints and preferences.
2. Gather Faculty constraints and preferences.
3. Create Meeting Pattern chart.

About the Meeting Pattern chart

To expedite placing sections, meeting patterns are used. Each segment of time in your schedule must have an associated code generated in the Meeting Pattern Table. A segment of time includes the period(s) and day(s), a section could potentially meet. Though the codes should be meaningful for ease of use when building the schedule, they will only be seen by the schedule builder. Therefore, they do not need to be fancy or understandable by the staff at large. They should only be meaningful to you and unique to the system.

The first step in setting up this table is to develop a meaningful coding structure for your school. For the sample below, we use a two days in the cycle, eight periods per day, with a few classes meeting for double periods. Our thought process for the coding structure is as follows:

Defining Periods:

Since we have double-period block classes, we must be able to define a starting and ending period. We have an eight period day. Therefore, since the period numbers are never more than one digit, we can define the starting and ending period in two digits. If there were no multiple-period classes, periods could be defined with only one digit, as the starting and ending period would always be the same.

If you do not have block classes, you would only need a single digit to define the period.

Defining Days:

We have a two-day cycle with some classes meeting day 1, some meeting day 2, and some meeting both days. This can be defined in one character by using "1" for day 1, "2" for day two, and "A" for classes that meet all days. Therefore, we can define day(s) in one character.

If you have a one day cycle, you would not even need to define the day. It can be assumed.

The hard work is done once the coding structure is defined. The following chart lists and defines each entry that would be necessary for our school. Please note that not all meeting pattern combinations are included in the chart. We will have a few sections that meet one day in the cycle for only a semester. However, since there are only a few of these, we will not describe all possibilities in the Meeting Pattern Table. As special meeting patterns become necessary, we will update the table and add only those specific patterns. **Note:** You can add meeting patterns any time during the schedule build process.

Sample Meeting Pattern Chart

8 Period, Blocked, Two-Day Meeting Pattern Chart							
Meeting Code	Period(s)			Meeting Code	Period(s)		
	Begin	End	Day(s)		Begin	End	Day(s)
11A	1	1	All	55A	5	5	All
111	1	1	1	551	5	5	1
112	1	1	2	552	5	5	2
12A	1	2	All	56A	5	6	All
22A	2	2	All	66A	6	6	All
221	2	2	1	661	6	6	1
222	2	2	2	662	6	6	2
23A	2	3	All	67A	6	7	All
33A	3	3	All	77A	7	7	All
331	3	3	1	771	7	7	1
332	3	3	2	772	7	7	2
34A	3	4	All	78A	7	8	All
44A	4	4	All	88A	8	8	All
441	4	4	1	881	8	8	1
442	4	4	2	882	8	8	2

Step 4 - Print scheduling analysis reports:

There are several tools you may want to have available during the build process:

- ?? List of classrooms [from *SIS2000+* – Classroom Editor, print list]
- ?? Course Directory [from *SIS2000+* - select for future track]
- ?? Faculty Directory Report [from *SIS2000+*]
- ?? Annotated Course Request List & Tally Report [from *SIS2000+*]
- ?? If you imported your Master Schedule, you may want a print out of the Master Schedule Report [from *SIS2000+*]
- ?? Itemized list of teacher constraints
- ?? Itemized list of room constraints
- ?? Itemized list of section constraints

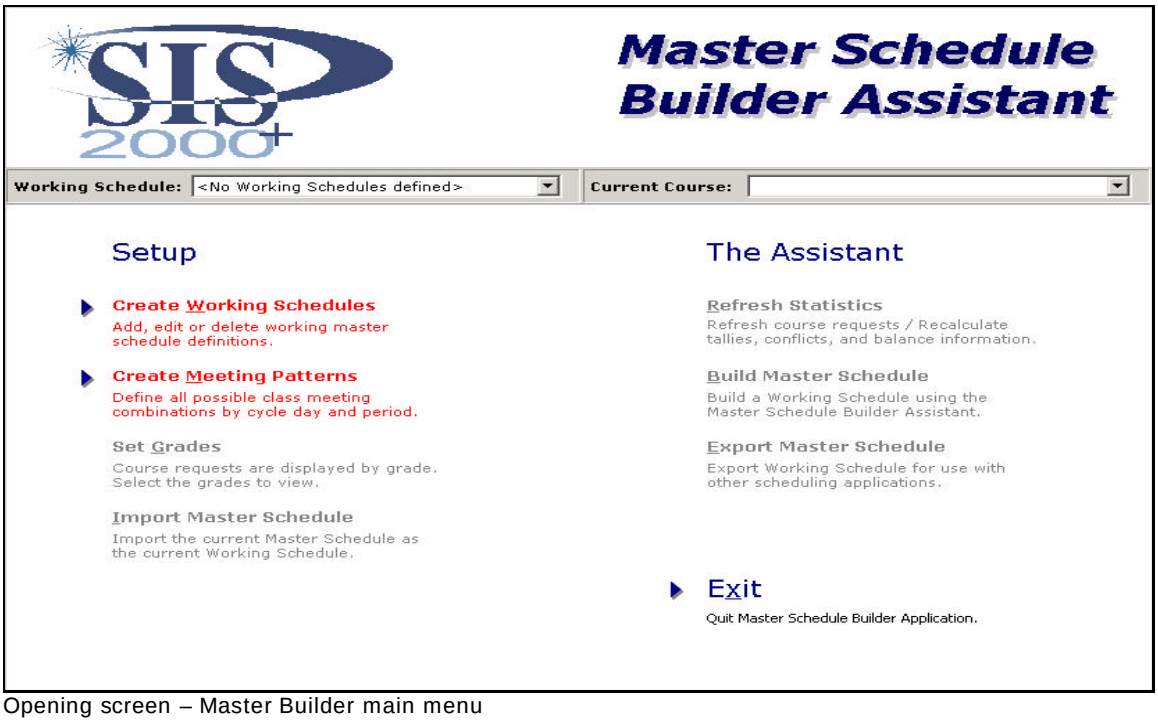
Master Builder Setup

A series of setup procedures must be completed in a prescribed order before the user can use the Master Builder to actually start building a master schedule.

Important: Before continuing with the steps below, make sure that all previous steps in the Getting Started section have been completed.

Master Builder Main Menu

Log on to the target school and the target future track that was created in the New Year Initialization process. Open the Master Schedule Builder Assistant application. The first screen is the main menu. It works as a checklist for the various tasks that are executed in the process of building a master schedule. Start on the left side under the Setup heading. Tasks must be completed in a prescribed order. Tasks that need to be completed first will be highlighted in **red font**. Tasks that have been successfully completed will turn to **black** font. Tasks that are disabled will be in **gray font** (disabled tasks are procedures that cannot be run until a prerequisite task is completed.)



Opening screen – Master Builder main menu

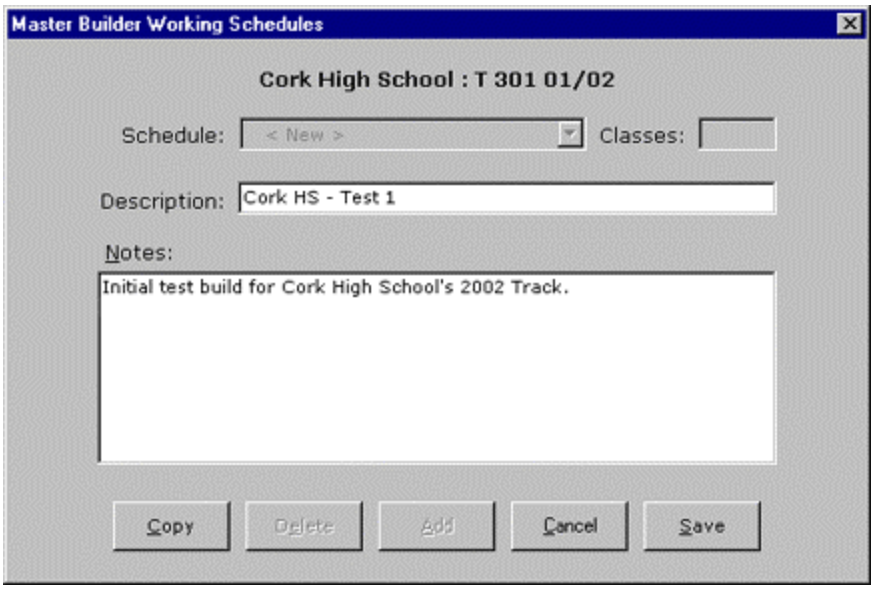
Step 1 - Create Working Schedule definitions

In this first step the user defines names for working master schedules. Master schedules may be defined as needed. If you begin one and decide to try a different approach, simply define a new working master schedule. Many different schedules can be defined for later use in different 'what if' scenarios - you may create as many master schedules as needed. These definitions serve as containers for the master schedule data that will be created during the build process in later steps.

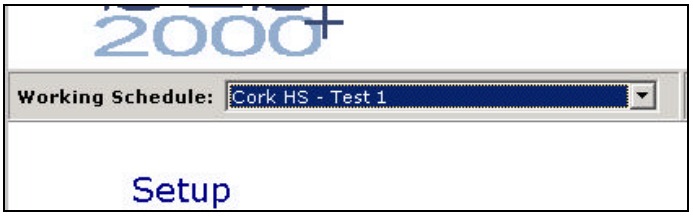
If you copied the master schedule during the New Year Initialization process, we recommend you begin by creating at least two working schedule definitions: one as the initial working schedule and one for keeping the previous year's master schedule, henceforth called the 'rolled master'.

Create a definition for initial working schedule

1. Click on the Create Working Schedule link in the main menu. This action opens the 'Master Builder Working Schedules' dialog box. Initially all the fields will be read-only, signified by their gray color.
2. Click on the **Add** command button to activate the edit mode.
3. Enter information in the **Description** and **Notes** fields



4. **Save** the definition (or Cancel to abort). After saving, the dialog screen remains in view in case you need to edit the fields.
5. Click the **Done** command button to close the dialog when the definition is complete. After closing the dialog box you will see the name of the new master schedule in the **Working Schedule** field in the toolbar drop-down list on the main menu. This field is where you will select a master schedule to work on when it comes time to use the Master Builder Assistant.



Note: The Master Builder Working Schedule dialog can be used later to edit, copy, or delete existing master schedules.

Create a definition for the rolled master schedule

If you saved the master schedule from the previous year during the New Year Initialization process, create a new master schedule definition using technique above. The definition you are creating will be the *container* for the master schedule data that is to be imported into the Master Builder in later steps. Give the new definition a name that can be recognized as the schedule from the previous year.

Step 2 - Create Meeting Patterns

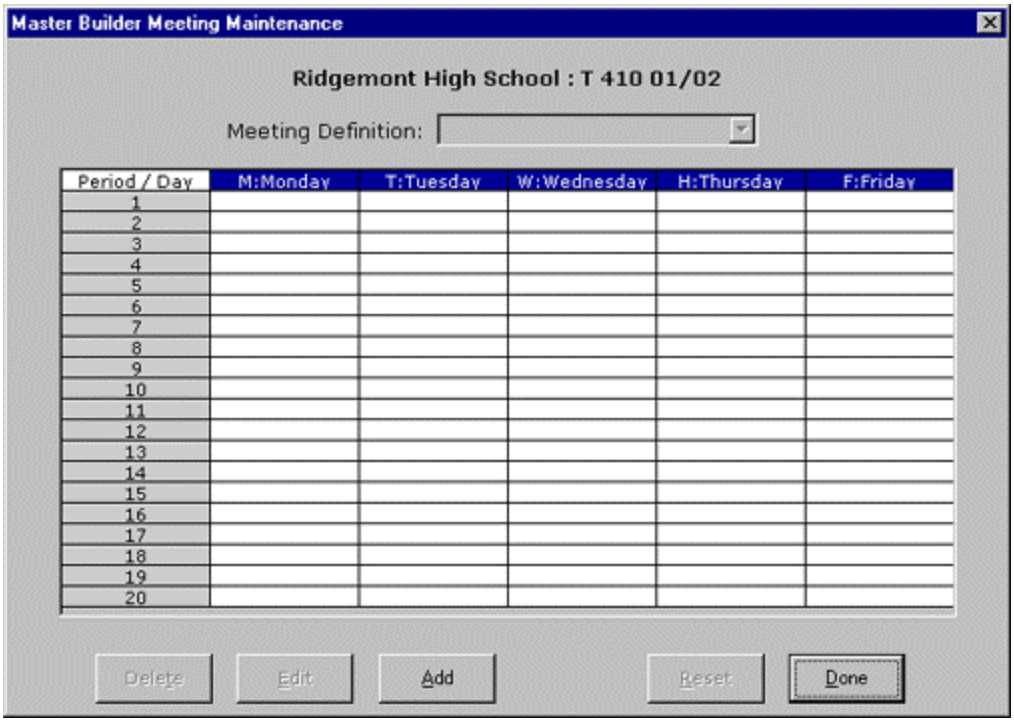
Each potential, unique combination of cycle day and period is called a meeting pattern. The combination of cycle day(s) and period(s) for which every section of every course in the master schedule may potentially meet should be defined prior to commencing work on a new master schedule. Patterns that have not been set up prior to opening the Assistant can be added 'on the fly' as the master schedule is being built.

In this step you must define all possible meeting times for the track you are working on. The Master Schedule Builder Assistant must have this information in order to create master schedules for the track.

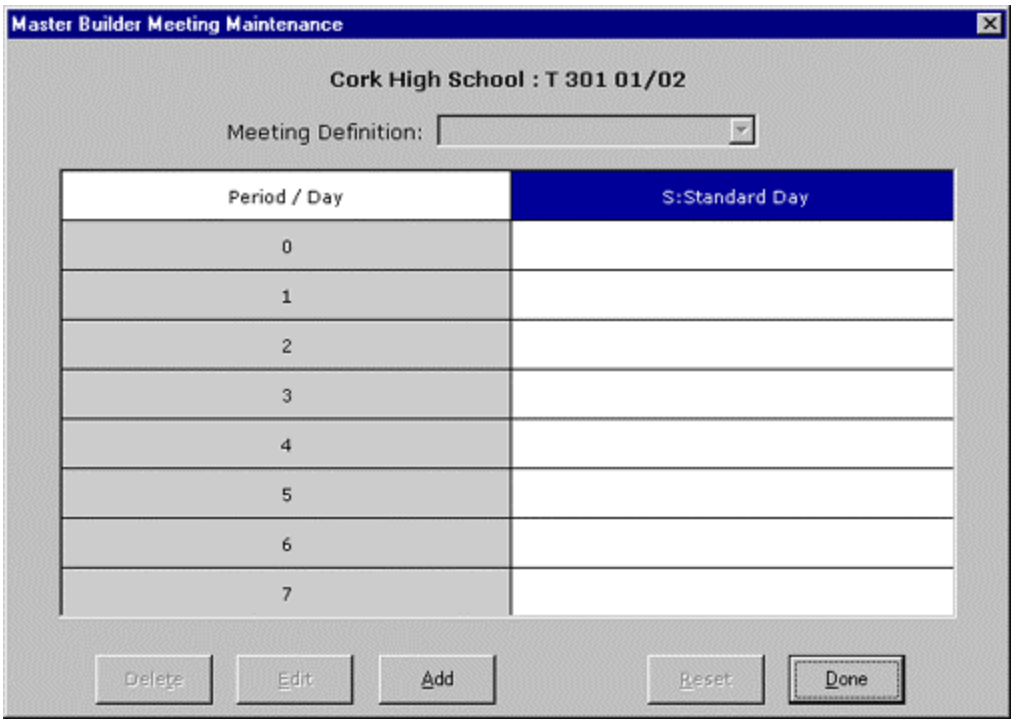
Using the chart created in Getting Started, Step 3.3, you will enter the codes and check the cells in a grid that represents the periods and cycle days of the track.

Create Meeting Definitions

1. Click on the Create Meeting Patterns link in the main menu. This action opens the 'Master Building Meeting Maintenance' screen, which shows all the cycle days in the tracks as columns and all the periods in a track as rows.

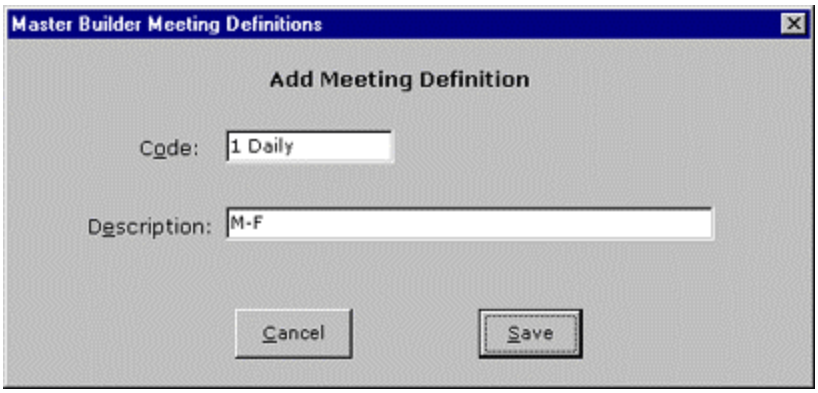


Sample meeting pattern grid for a 5-cycle day track



Sample meeting pattern grid for a single cycle day track

2. Click on the **Add** command button to open the 'Master Builder Meeting Definitions' dialog box. Enter a **Code** and **Description** for a meeting time.

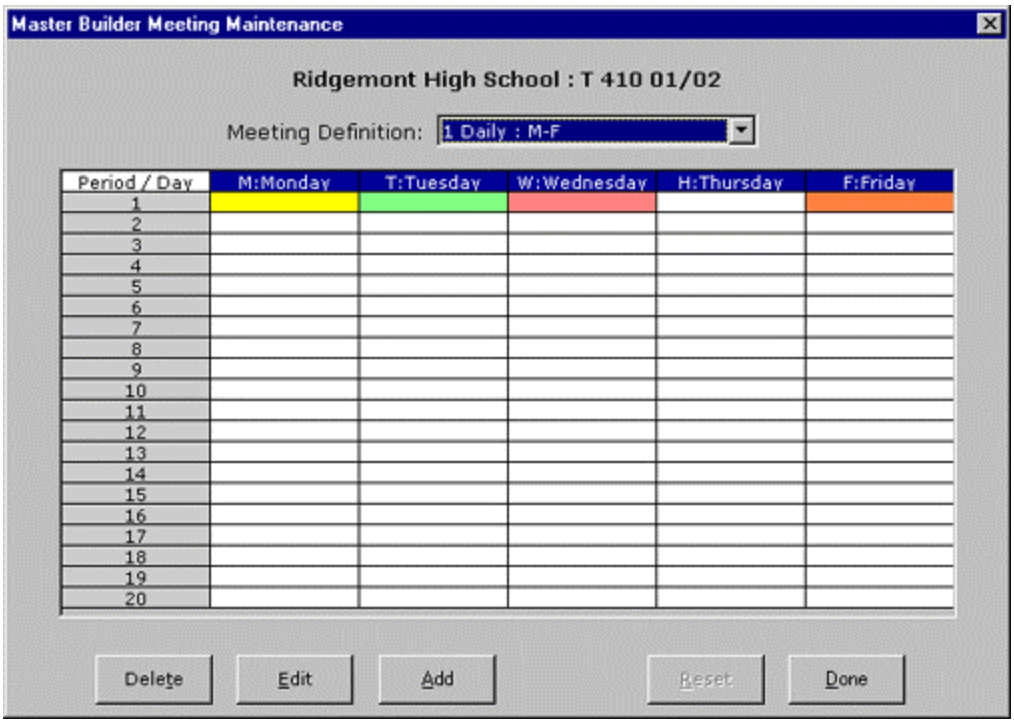


Sample Meeting Definition

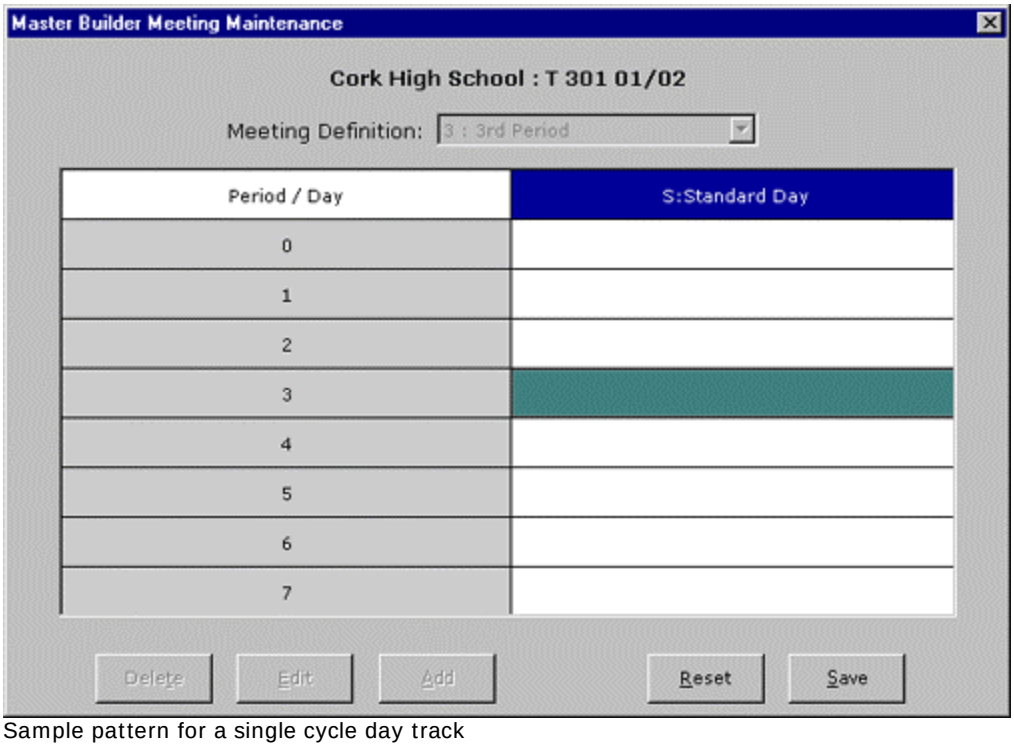
3. **Save** definition (or Cancel to abort).
4. **Repeat.** Repeat steps 2 and 3 until all possible meeting patterns have been defined.

Create Meeting Patterns

1. In the 'Master Builder Meeting Time Maintenance' screen select a meeting time definition to apply in the **Meeting Definition** field in the upper right.
2. Click each cell in the grid where you want this meeting pattern to be applied. As each cell is defined a color will be displayed. The colors used in the cells will match the colors used in the Track Editor for defining the cycle days of the current track.



Sample pattern for a 5-cycle day track

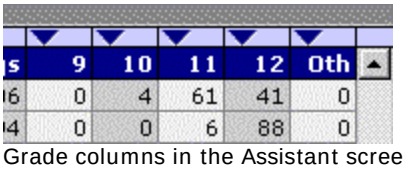


Sample pattern for a single cycle day track

3. After all meeting times have been placed, double check for accuracy against your written meeting patterns chart.

Step 3 - Set Grades

This step is for setting the grade level columns that will appear in the Assistant screen. The number of student course requests for each course is distributed across columns according to grade level.



	9	10	11	12	Oth
16	0	4	61	41	0
14	0	0	6	88	0

Grade columns in the Assistant screen

Due to limitations in screen space there is room for only four grade level columns plus a fifth column (**Oth**er) that will consolidate the number of course requests for any remaining grade levels that could not be included in the first four columns.

1. Click on the Set Grades link in the main menu. This action opens the 'Master Builder Grade Levels' dialog.
2. In the fields provided, designate the grades to be displayed in the first four columns from left to right.

3. If there are more than 4 grades to be scheduled, select 'Yes' in the **Other** field.
4. **Save** grade level definitions (or Undo to reset). Then click **Done** to close the dialog.

Note: Whenever changes are made to the grade settings, Refresh Statistics must be run to update tallies.

Step 4 - Import and save the rolled master schedule

If your master schedule for the previous year was rolled (copied) to the current future track during the New Year Initialization process it will be the default master schedule for that future track. At this stage, the rolled master schedule exists in the core *SIS2000+* scheduling applications, specifically the Master Schedule Editor, and will be overwritten by any new master schedules that will be built in the Builder and exported to the Master Schedule Editor. Therefore it is a good idea to save the rolled master before going any further. This is done by first using the Master Builder to create a definition for the rolled master schedule (which you should have done previously) and then importing it into the Master Schedule Builder Assistant for safekeeping. The Master Schedule Editor application does not have the capability of saving different versions of a master schedule whereas the

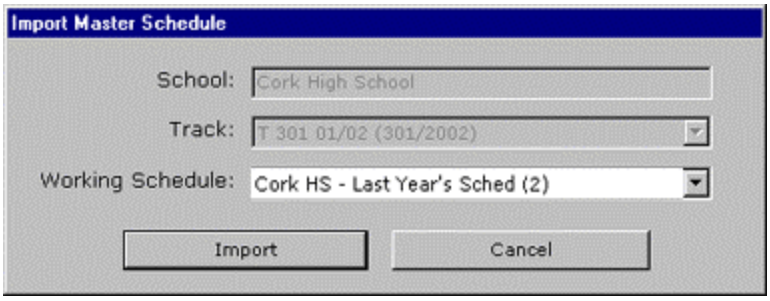
Master Builder does. You may not be planning to use this schedule; we are just archiving it for safe keeping and future reference.

Prerequisites to import

1. Meeting patterns must have been created that will cover all possible meeting patterns of the master schedule to be imported.
2. Set Grades must be completed. The current grades levels set will apply to all working schedules in the Builder.

Import procedure

1. Click on the Import Master Schedule link in the Master Builder main menu. This action opens the 'Import Master Schedule' dialog. Two read-only fields at the top show the current School and Track that are logged on.



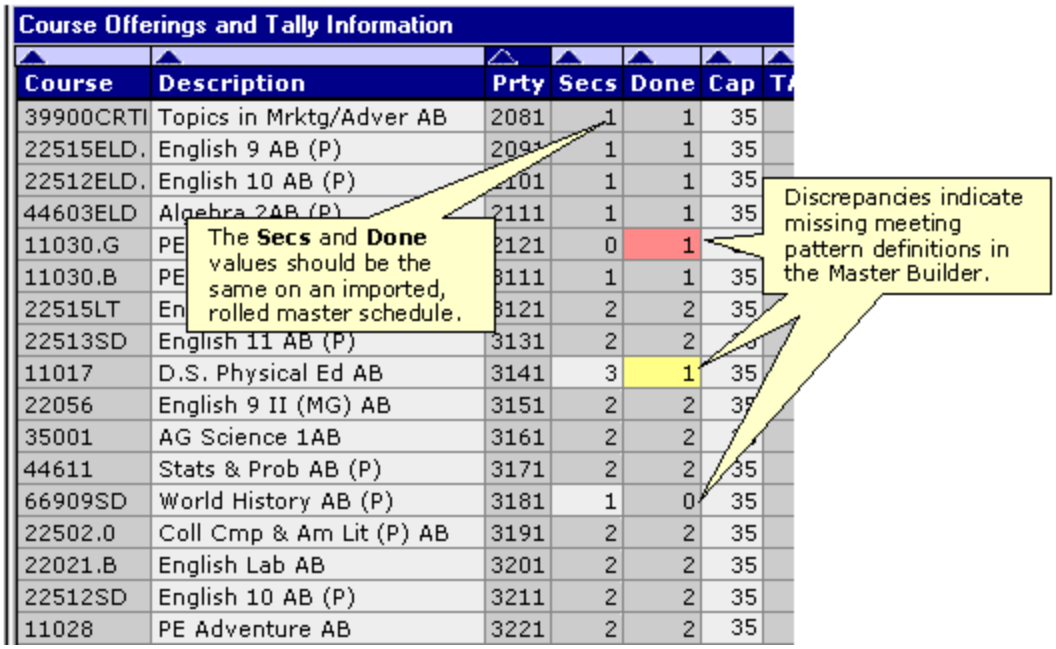
2. Select the target definition. In the **Working Schedule** field select the master schedule definition that you created to contain the rolled master.
3. Click on the **Import** command button to execute the import process. This may take a few moments to complete.

Check Tally

Imported, rolled master schedules are normally used for reference and analysis purposes only. However, in order for your imported master schedule to display accurate data it is very important that the Master Builder has the all the defined meeting patterns necessary to accommodate all possible meeting patterns of the imported schedule. Otherwise, some course sections will not get placed on import and the Balance Summary will be incorrect (See 'Master Schedule Construction' for details.)

Verify your data by checking the Tally as follows:

Open the Assistant screen (click on Build Master Schedule link on the Master Builder Main Menu). Look at the 'Course Offerings and Tally Information' sub-screen. Compare the values in the **Sec**tion column with the Values in the **Done** column for all courses in the list. The **Sec** value is the number of sections *offered* for the course; the **Done** column is the number of sections *placed* in the Master Schedule. These values should be the same. When there is a match, the cells in both columns will be dark gray. If there are discrepancies in these values, it means that there one or more missing meeting pattern definitions. Track down these missing definitions and add them to the Master Builder.


Course Offerings and Tally Information
Course
Description
Prty
Secs
Done
Cap
39900CRTI Topics in Mrktg/Adver AB 2081 1 1 35
22515ELD. English 9 AB (P) 2091 1 1 35
22512ELD. English 10 AB (P) 2101 1 1 35
44603ELD Algebra 2AB (P) 2111 1 1 35
11030.G PE 2121 0 1
11030.B PE 3111 1 1 35
22515LT En 3121 2 2 35
22513SD English 11 AB (P) 3131 2 2
11017 D.S. Physical Ed AB 3141 3 1 35
22056 English 9 II (MG) AB 3151 2 2
35001 AG Science 1AB 3161 2 2
44611 Stats & Prob AB (P) 3171 2 2 35
66909SD World History AB (P) 3181 1 0 35
22502.0 Coll Cmp & Am Lit (P) AB 3191 2 2 35
22021.B English Lab AB 3201 2 2 35
22512SD English 10 AB (P) 3211 2 2 35
11028 PE Adventure AB 3221 2 2 35
The Secs and Done values should be the same on an imported, rolled master schedule.
Discrepancies indicate missing meeting pattern definitions in the Master Builder.

Master Schedule Construction

Introduction

The number one objective in building a quality master schedule to accommodate the needs of the students, that is, to give every student the courses they need. In this sense it could be said that the design of the master schedule is primarily driven by student course requests.

In the real world, however, this objective will have to be reconciled with a variety of constraints on school resources, such as teacher availability, teacher preferences, available classrooms, classroom size and functionality, scheduling rules, etc. Thus the master schedule inevitably becomes a big puzzle of numbers. The goal is to devise a master schedule that accommodates all student course requests with no schedule conflicts and perfect section balance (number of students distributed evenly across all sections).

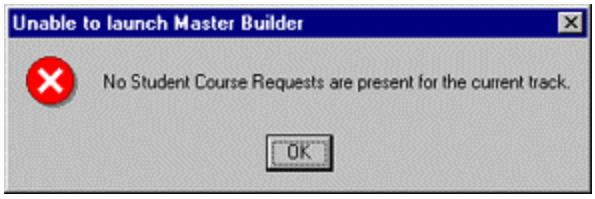
The Master Schedule Builder Assistant application provides a computer-assisted method to achieve these goals.

Launch the Assistant

Up to this point all of the prerequisite procedures, analysis, and set up tasks were only in preparation for building the actual master schedule. The purpose of all those steps is to bring together all the data that will be needed for computer assisted building. The core of the Master Schedule Builder Assistant application is the Assistant screen itself, which is a workspace consisting of six sub-screens. This is where the user actually builds a master schedule. The sub-screens display the data that was prepared and serve as interactive tools in the building process.

1. Log on to the target school/track.
2. Open the Master Builder application from the *SIS2000+* Scheduling Menu

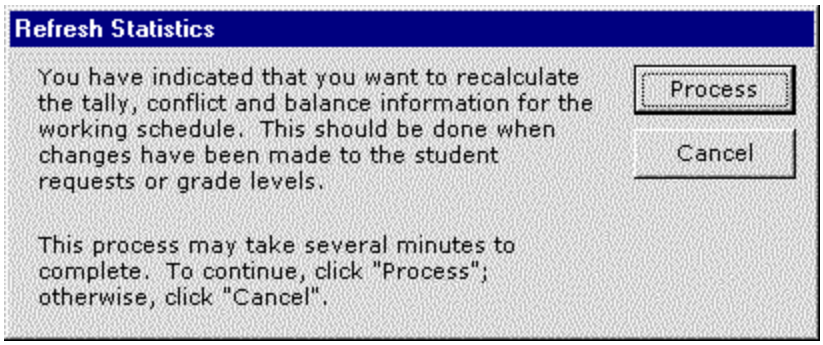
   Possible error message:



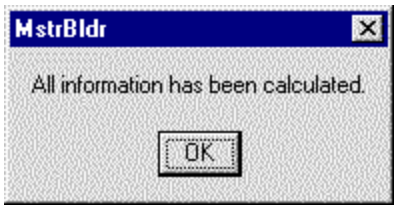
   The target track must have at lease one course request entered in the Course Request Editor in order for the Master Builder application to launch.

3. Before launching the Assistant screen, click on the Refresh Statistics link under the Assistant column on the main menu. In the screen that appears, click on the **Process** button to refresh data (or Cancel to abort). The Master Builder works with an internal course request tally and conflict matrix that is built by using the Refresh Statistics function. This process must be run to assure changes to course requests are represented in the Master Builder screens.

Note: Only primary course requests will be imported into the Master Builder. Alternate course requests are ignored.



When the process is complete a confirmation message will appear.

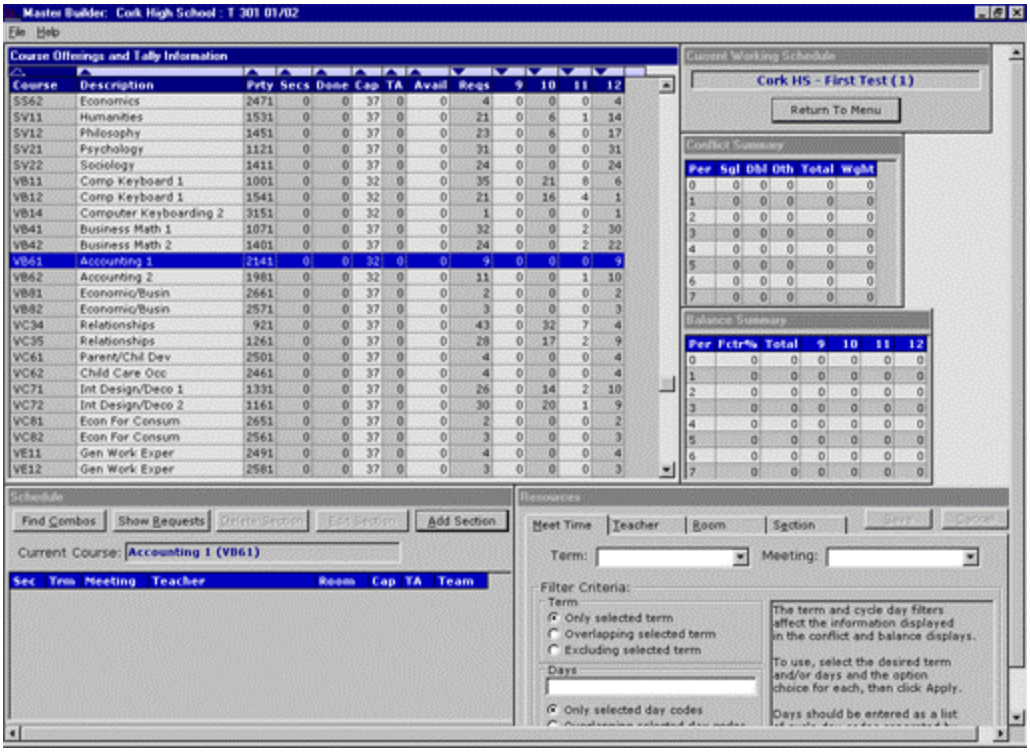


Click OK to exit Refresh procedure

4. Select a Master Schedule definition in **Working Schedule** field the toolbar on the main menu. You may also select a default course to work with in the **Current Course** screen
5. Launch the Assistant screen by clicking on the Build Master Schedule link in the main menu.

Note: The Build Master Schedule link will be enabled only when the setup steps have been completed properly. If the link is gray it cannot be executed. In this case go back and check that you have completed all required setup tasks correctly.

Screen Layout and Functionality

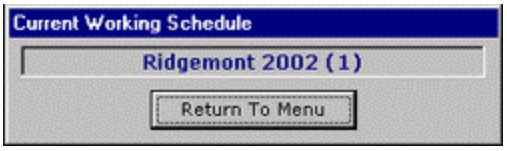


Sample Assistant workspace with no courses yet scheduled

The following are legends for each of the six sub-screens:

Current Working Schedule sub-screen

A read-only screen in the upper right that displays the name of the current working schedule. It also provides a link to go back to the main menu.

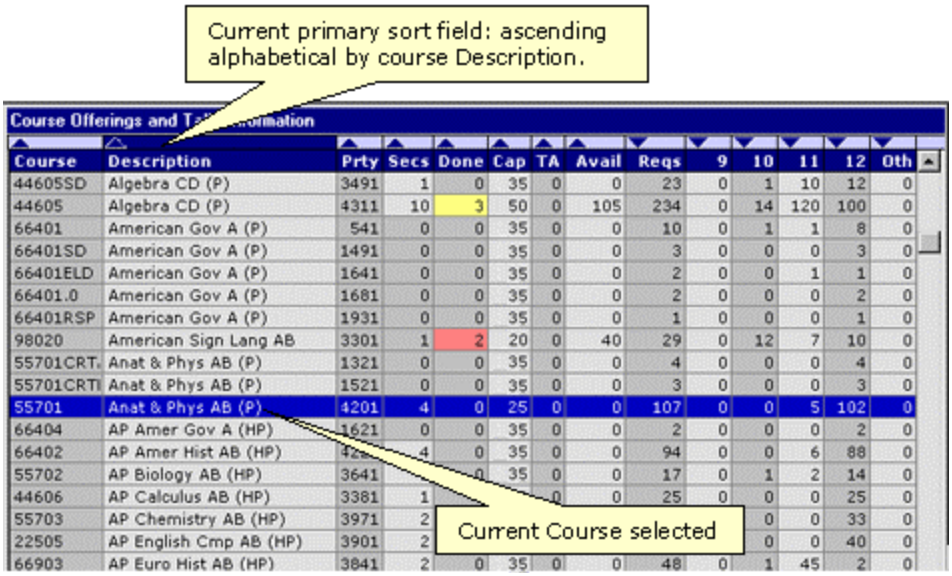


Course Offerings and Tally Information sub-screen

This is a list of all courses that have course requests in the current track. It is essentially a Course Request Tally with other relevant data included. This screen controls the building of the master schedule. Courses to be placed are selected by pointing and clicking on the course you desire in this sub-screen.

You will want to sort this screen to help you with your 'Order of Placing Sections' during the build process. Any column can be used as a primary sorting field for the list by clicking on the arrow graphic above the column header. The sorting directions are fixed to be either ascending (up arrow) or descending (down arrow) depending on the field selected. The arrow graphic of the current primary sorting field will be highlighted in dark blue.

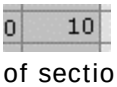
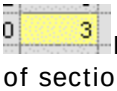
When entering the Assistant screen, the program will select the next sequential course from where you left off last time in the application unless you have selected another default course.



Course Offerings and T... formation

Course	Description	Prty	Secs	Done	Cap	TA	Avail	Reqs	9	10	11	12	Oth
44605SD	Algebra CD (P)	3491	1	0	35	0	0	23	0	1	10	12	0
44605	Algebra CD (P)	4311	10	3	50	0	105	234	0	14	120	100	0
66401	American Gov A (P)	541	0	0	35	0	0	10	0	1	1	8	0
66401SD	American Gov A (P)	1491	0	0	35	0	0	3	0	0	0	3	0
66401ELD	American Gov A (P)	1641	0	0	35	0	0	2	0	0	1	1	0
66401.0	American Gov A (P)	1681	0	0	35	0	0	2	0	0	0	2	0
66401RSP	American Gov A (P)	1931	0	0	35	0	0	1	0	0	0	1	0
98020	American Sign Lang AB	3301	1	2	20	0	40	29	0	12	7	10	0
55701CRT.	Anat & Phys AB (P)	1321	0	0	35	0	0	4	0	0	0	4	0
55701CRTI	Anat & Phys AB (P)	1521	0	0	35	0	0	3	0	0	0	3	0
55701	Anat & Phys AB (P)	4201	4	0	25	0	0	107	0	0	5	102	0
66404	AP Amer Gov A (HP)	1621	0	0	35	0	0	2	0	0	0	2	0
66402	AP Amer Hist AB (HP)	42...	4	0	35	0	0	94	0	0	6	88	0
55702	AP Biology AB (HP)	3641		0	35	0	0	17	0	1	2	14	0
44606	AP Calculus AB (HP)	3381	1			0	0	25	0	0	0	25	0
55703	AP Chemistry AB (HP)	3971	2							0	0	33	0
22505	AP English Cmp AB (HP)	3901	2							0	0	40	0
66903	AP Euro Hist AB (HP)	3841	2	0	35	0	0	48	0	1	45	2	0

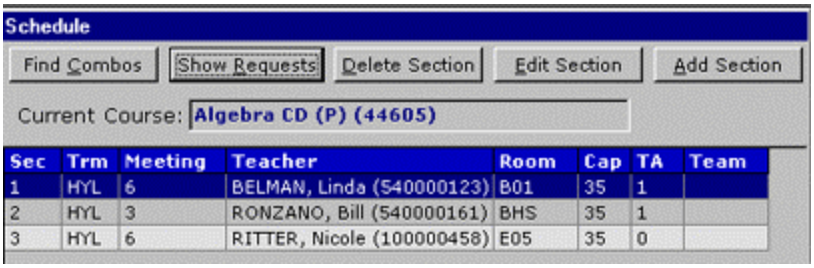
Legend:

Column	Description
Course	**Course ID number:** As it appears in the District Courses database.
Description	**Course Description:** As it appears in the District Courses database.
Prty	**Priority Rating:** A system-generated number to rate a priority for scheduling a course from the point of view of the Student Loader application. Lowest number is highest priority. You will most likely not use this priority.
Secs	**Sections:** Number of sections assigned to this course. These values were manually entered in the Track Course Selection application, based on the number of course requests for each course offered vs. staffing allocations. It is essential for these numbers to be correct for the application to give you maximum assistance. If a value is not correct you must return to the Track Course Selection application and correct it.
Done	The number of sections that have already been scheduled or 'placed' for the course. ??  When the number of sections placed *equals* the number of sections assigned (**Secs**) the **Done** cell will turn dark gray. ??  If the number of sections placed is *less* than the number of sections assigned, the **Done** cell will display as yellow. ??  If the number of sections placed is *more* than the number of sections assigned the **Done** cell will turn pink. This field controls the Balance Summary. If there is a pink cell during the build process we strongly suggest correcting the number of sections.
Cap	**Capacity:** The default capacity of a course section, as entered in the District Courses application. This value can be overridden in each section placed during the construction of the master schedule. The

	value displayed here serves only as a default.
TA	**Teaching Assistants:** The default number of teaching assistants assigned to a course section. This value can be overridden in each section placed during the construction of the master schedule.
Avail	**Available:** The total number of seats that have been placed in the current master schedule. (This number is the tally of the **Cap** values in the Schedule sub-screen for that course.)
Reqs	**Course Requests:** The total number of primary requests for this course.
9-10-11-12	**Course Requests by Grade Level:** The number of requests for this course broken down by grade level. Grade levels shown are customizable in the setup procedure.
Oth	**Course Requests by Other Grade Level:** The combined total of requests for this course from grade levels other than the grades shown in the first four columns. Unless intentional, this column should be blank.

Schedule sub-screen

This screen itemizes the sections already placed for the selected course. It also contains command buttons for updating course sections (Add, Delete, Edit) and showing attributes of scheduled sections, plus two drill-down utilities for displaying the names of students who are requesting the Current Course.

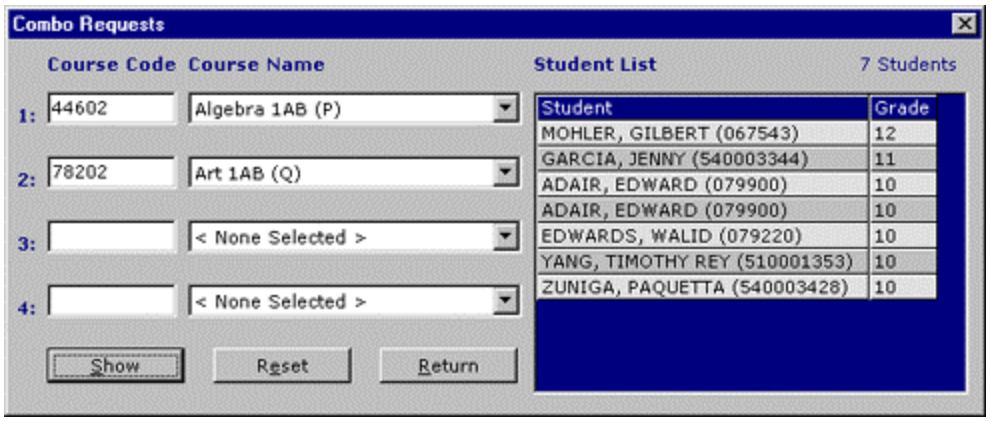


Sample section information for Algebra CD (P) (44605)

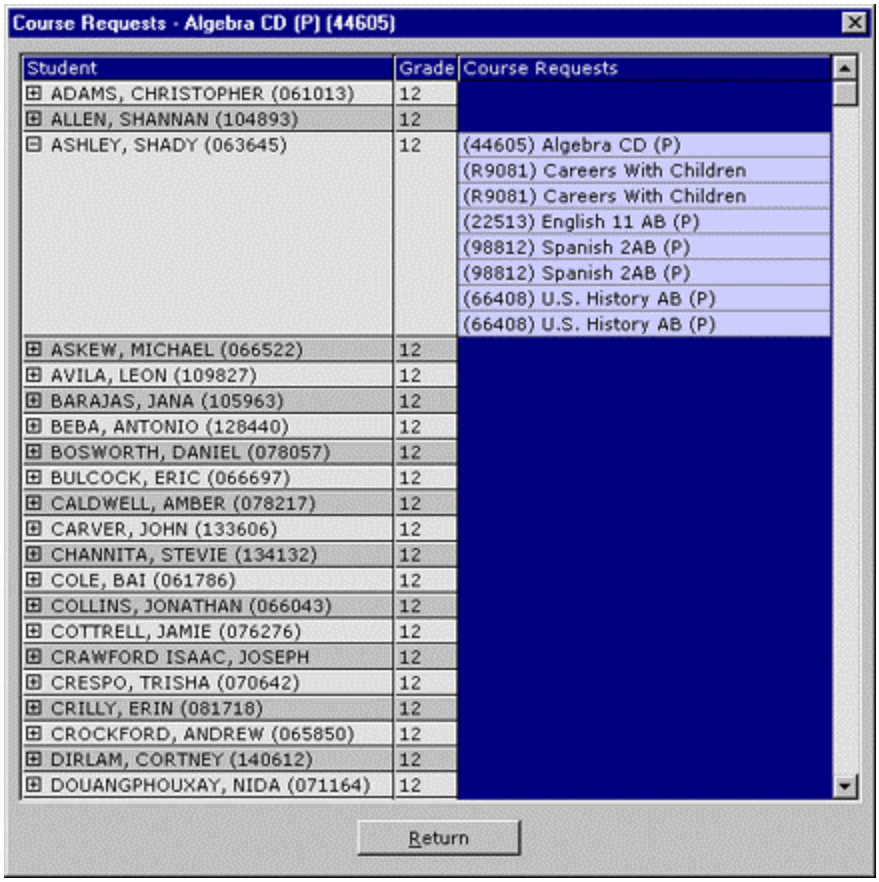
?? Attributes of the scheduled course sections for the Current Course are displayed in a grid as follows:

  - ?? **Sec =** Section number
  - ?? **Trm =** Term code
  - ?? **Meeting** = Meeting pattern code
  - ?? **Teacher =** faculty member assigned to teach section
  - ?? **Room** = Room number
  - ?? **Cap =** Section capacity
  - ?? **TA** = Number of teaching assistants assigned to section
  - ?? **Team =** Teaching team assigned to this section

?? The **Find Combos** command button opens a dialog screen with four lines. This is a tool for analyzing up to four-way potential scheduling conflicts. Here the user can retrieve a list of students who have up to four course requests in common. Enter the Course Code numbers or select a Course Name for two or more courses. Then click on the **Show** button to see an itemized list of the students requesting the combination of those courses. Click **Reset** to clear all fields and start over. Click **Return** to close the dialog and go back to the Schedule sub-screen.



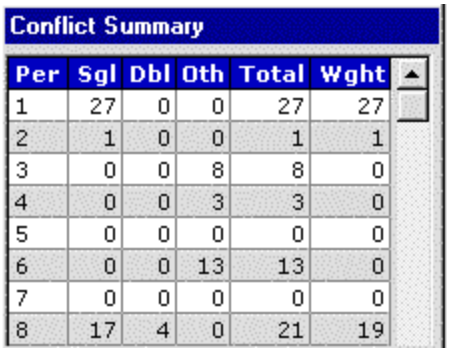
?? The **Show Requests** command button is another handy scheduling utility. This command displays an itemized list of all students who have requested the Current Course. Click on the plus or minus sign beside each student's name to expand or contract a sub list of the other courses that student has requested.



Sample Show Requests query

Conflict Summary sub-screen

This screen is used for analysis when placing singleton and doubleton courses. It shows the number of students in common for the Current Course to be placed and all courses previously placed in the master schedule. This table is used to 1) place singleton and doubleton courses without conflicts and 2) isolate dovetail conditions for less than full duration term and day courses. For detailed instructions, see 'Using the Conflict Summary for Analysis' later in this document.

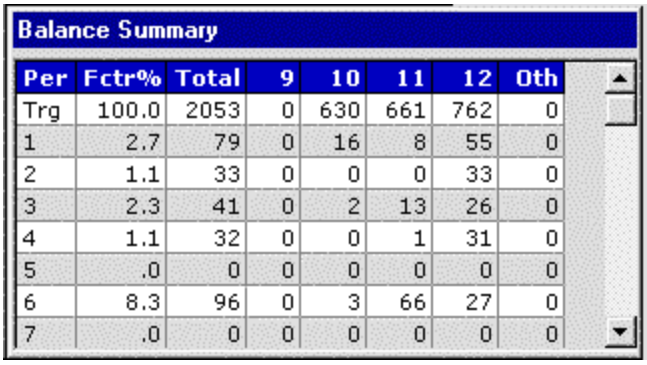


Conflict Summary

Per	Sgl	Dbl	Oth	Total	Wght
1	27	0	0	27	27
2	1	0	0	1	1
3	0	0	8	8	0
4	0	0	3	3	0
5	0	0	0	0	0
6	0	0	13	13	0
7	0	0	0	0	0
8	17	4	0	21	19

Balance Summary sub-screen

A good master schedule will have an even distribution of scheduled students per period. The Balance Summary screen helps you do this. It is used for analysis when placing multi-sectioned courses in the master schedule. It displays the number of students already virtually placed in the master schedule by grade level for a given period, term(s), and/or day(s). The Target row at the top shows the total number of students pre-registered per grade level. For more details, see 'Using the Balance Summary for Analysis'.



Balance Summary

Per	Fctr%	Total	9	10	11	12	Oth
Trg	100.0	2053	0	630	661	762	0
1	2.7	79	0	16	8	55	0
2	1.1	33	0	0	0	33	0
3	2.3	41	0	2	13	26	0
4	1.1	32	0	0	1	31	0
5	.0	0	0	0	0	0	0
6	8.3	96	0	3	66	27	0
7	.0	0	0	0	0	0	0

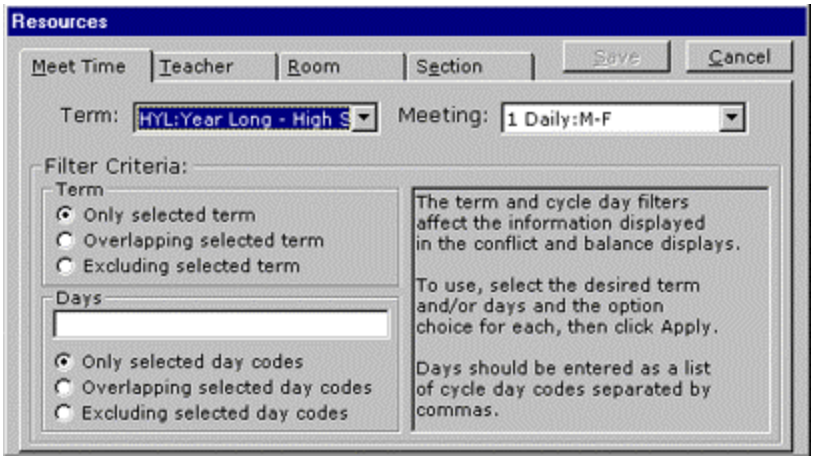
Resources sub-screen

This screen has two main functions:

1. It is used to place a section in the master schedule and/or assign resources to sections (faculty, room numbers, etc.).
2. It provides parameters for filtering the data displayed in the Conflict Summary and Balance Summary.

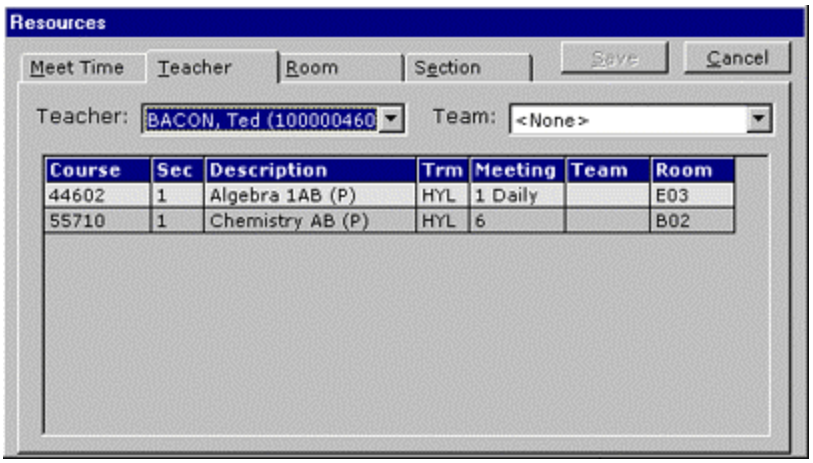
There are four tabs in the Resources sub-screen:

Meet Time tab



Term code and meeting time for the current course section are assigned here.
Term and cycle day Filter Criteria for the Conflict Summary and Balance Summary can be applied also.

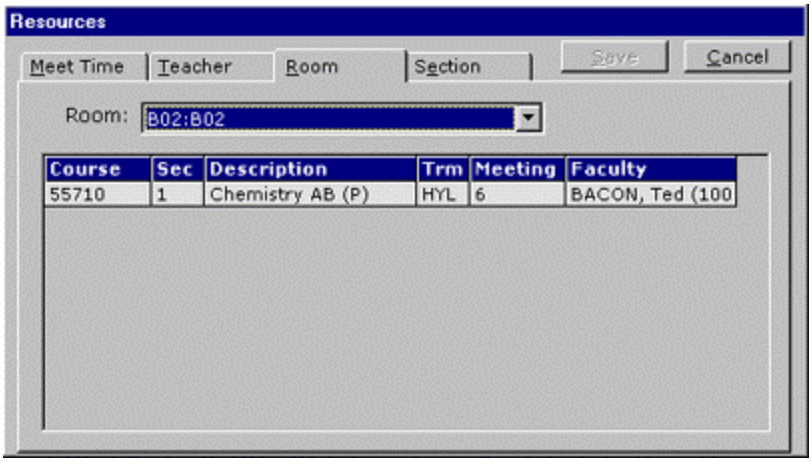
Teacher tab



The teacher and team for the current course section are assigned here.
The grid shows the all the course sections that the selected teacher is assigned to.

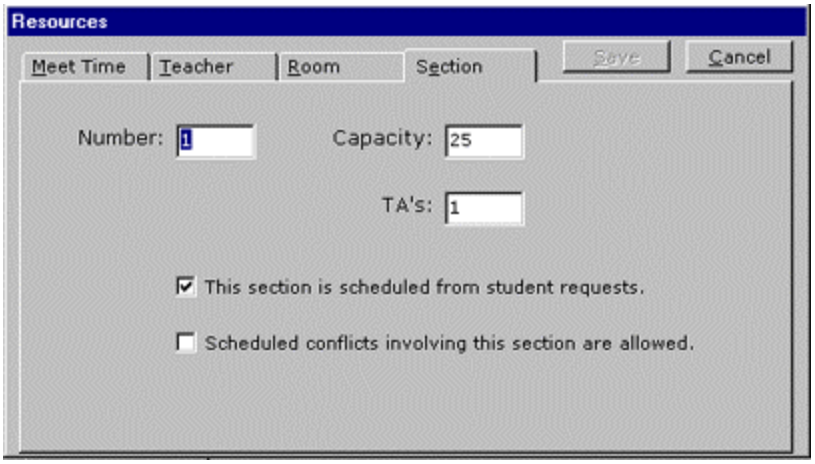
Note: When there is no teacher selected in the **Teacher** field, the grid will display a list of ALL placed course sections that do not have teacher assignments.

Room tab



The room number for the current course section is assigned here.
The grid shows all the course sections that have been scheduled to the selected room.

Section tab



The section number, capacity, and TA's are assigned to the current course section.

- **This section is scheduled from student requests**
  This check box sets the "Is scheduled" flag in the Master Schedule.
- **Scheduled conflicts involving this section are allowed**
  This check box sets the "Conflict OK" flag in the Master Schedule.

Scheduling Sections

Order of Placing Sections

The order in which you place sections in the master schedule has the biggest impact on your success. The order of placing sections varies from school to school. The recommended order for a traditional high school would be as follows:

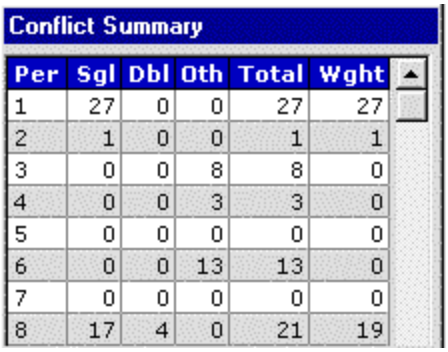
1. Constraints (courses which have no scheduling flexibility per school policy)
2. All block singletons
3. All block doubletons
4. Senior singletons (with the highest percentage of seniors first)
5. Junior singletons (with the highest percentage of juniors first)
6. Sophomore singletons (with the highest percentage of sophomores first)
7. Freshman singletons (with the highest percentage of freshman first)
8. Senior doubletons (etc. as above)
9. Junior doubletons
10. Sophomore doubletons
11. Freshman doubletons
12. Senior three-section courses > four-section courses > five-section courses, etc. until the senior schedule is built and balanced.
13. Junior three-section courses > four-section courses > five-section courses, etc. until the junior schedule is built and balanced.
14. Sophomore three-section courses > four-section courses > five-section courses, etc. until the sophomore schedule is built and balanced.
15. Freshman three-section courses > four-section courses > five-section courses, etc. until the freshman schedule is built and balanced.

Placing Sections

1. Identify your order of placing sections and sort the Course Offerings and Tally Information in such a way that will allow you to move down the list of courses in the most expedient manner.
2. Select the course you wish to place next.
3. If placing a singleton or doubleton course use the Conflict Summary screen to determine the best placement of the course/section(s).
4. If placing a multi-section course, use the Balance Summary to select the best placement of the course/section(s).
5. Place the section in the master schedule.
   - Click the **Add Section** button in the Schedule sub-screen. The course will appear in the schedule list.
   - In the Resources sub-screen, enter the term and meeting pattern in the 'Meet Time' tab and enter the capacity and TAs in the 'Section Tab'.
   - The teacher and room number can also be assigned at this time or at a later time (Often department chairpersons assign faculty after the master schedule has been completed.)
   - Save
6. Continue to place sections as described above in the order of priority appropriate for you.

Using the Conflict Summary for analysis

As sections are placed, the Conflict Summary screen displays the total number of students who will be in conflict per period if the Current Course section is placed in that slot.



Conflict Summary

Per	Sgl	Dbl	Oth	Total	Wght
1	27	0	0	27	27
2	1	0	0	1	1
3	0	0	8	8	0
4	0	0	3	3	0
5	0	0	0	0	0
6	0	0	13	13	0
7	0	0	0	0	0
8	17	4	0	21	19

Per	Period
Sgl	Singleton potential conflicts by period.
Dbl	Doubleton potential conflicts by period.
Other	Multi-section courses potential conflicts per period.
Total	Total potential conflicts per period.
Wght	Weight value = number of singleton conflicts plus half of the doubleton conflicts per period.

This data is used for analysis when building a schedule, as follows:

Place Singleton Sections:

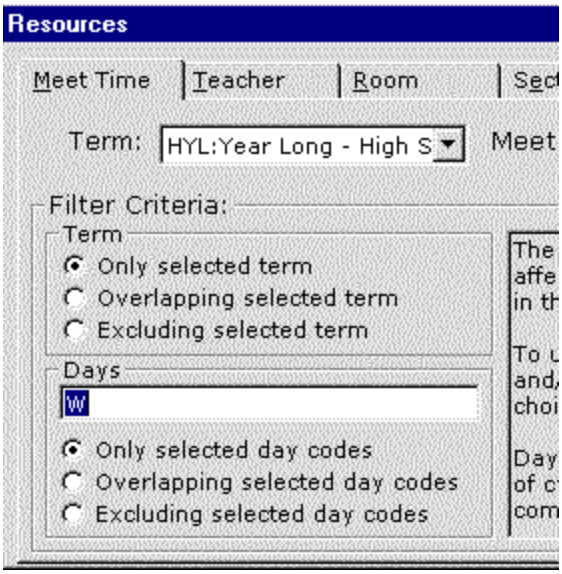
Singleton sections should be placed in the master schedule with no head-to-head conflicts with other singletons or doubletons (if possible). The best placement for a singleton section is where there are no singleton or doubleton conflicts for that period. If this is not possible, place the section where there are no singleton conflicts, and very few doubleton conflicts.

If you are placing a block class (meets for more than one period), you will be looking for conflict-free consecutive periods.

When placing alternating day classes, you want to place them conflict free and take advantage of any dovetailing opportunities that may exist. The following techniques will help you accomplish these objectives:

Use Filter Criteria for tracks with more than one cycle day

The resources sub-screen allows the user to filter the Conflict Summary Screen and the Balance Summary Screen. For tracks with more than one cycle day, check for conflicts by setting the Filter Criteria for one cycle day at a time. Select the **Only selected day codes** radio button and then enter the target cycle day code in the **Days** field (cycle day codes are defined in the Track Editor). This will identify all potential conflicts with placing that section.



Sample cycle day filtering

Look for dovetailing using the **Days** criteria field by setting your day pattern to the opposite day(s) you intend to place your section. For example, in a 2-cycle day track, if you want to place the section on day two, enter the code for day one in the **Days** field and select the **Only selected day codes** radio button. This will show conflicts (dovetails in this case) with any section that meets only on day one. These conflicts are potential dovetails if you place your section on day two. If those dovetailing periods were conflict free when you checked conflicts using **Only selected day codes** option for the day(s) you want to place the section, you have found a good slot for that section.

Dovetailing semesters

Always use the Filter Criteria for Term to search for any dovetailing opportunities. They are often so few and far between. Select a target term in the **Term** field, then use the radio buttons to exclude or include the term in the conflict data output. When placing semester classes, search the screen for conflicts one semester, but not the other. If at all possible, you want to place the semester sections in the same period, but the opposite semester of the conflict. You must create these semester flow situations for your Master Schedule to work well.

Place Doubleton Sections:

Doubleton sections placement logic is identical to singleton placement, but you are placing two sections. Therefore, search for two periods with no singleton or doubleton conflicts. If this is not possible, locate the two periods with no singleton conflicts and the fewest doubleton conflicts.

If you are placing a block class search for two consecutive period blocks that have no conflicts with singletons or doubletons.

Again, please remember to set the Day Filter Criteria in the Resources screen to check conflicts if you are placing an alternating day class. And as with singletons, keep searching for those dovetailing sections with the day pattern function. These are periods that show conflicts on the alternate days only.

When placing semester classes, you must search out the semester course dovetail situations. These will be identified on the screen where there are conflicts one semester, but not the other. If at all possible, you want to place the semester sections the same period, but the opposite semester from the semester conflicts. These become semester dovetail situations, not conflicts. Use the Term Filter Criteria to analyze these placements.

Place Alternating-Day Multiple-Section Classes:

Overall balance and dovetailing in the Master Schedule are largely controlled by the placement of the multiple-section courses. As with singletons and doubletons, you must create alternating-day class flow for the students to schedule properly. We do not conflict check alternating-day multiple-section classes to identify conflicts. We conflict-check them to locate the dovetailing opportunities. When conflicts are located on one day but not the other, we know we have common students and must schedule the current class the opposite day(s) for the students to schedule. Dovetail periods/days can be identified in the Builder by displaying conflicts for alternating days, and comparing the totals. Place the multiple-section classes in the same period but the opposite day(s) as the conflicts. To select the day(s) you wish to conflict check, set the Day Filter Criteria in the Resources screen.

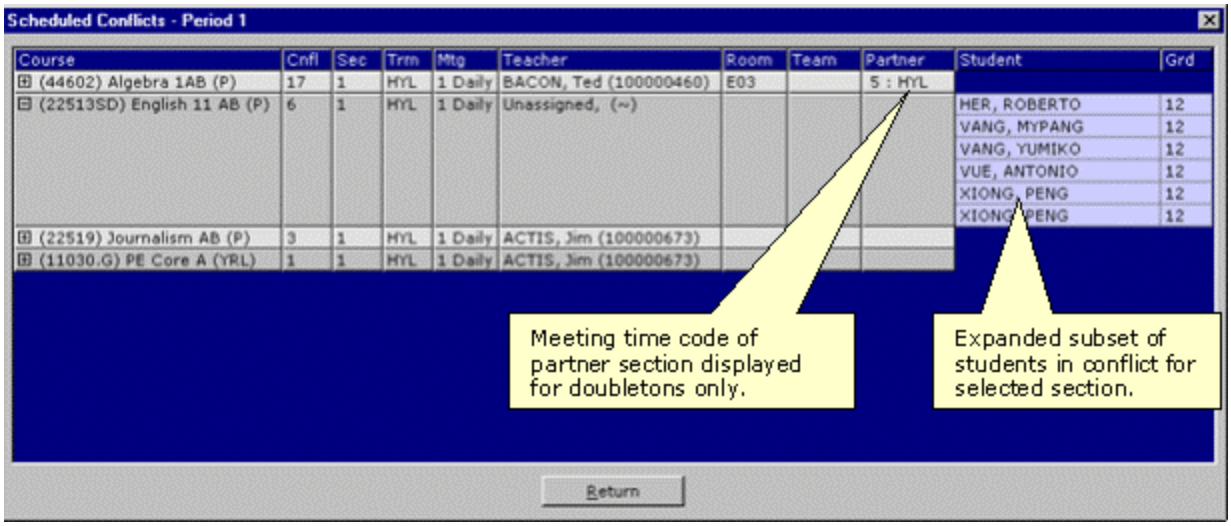
Using the Weighted Summary

The Weighted Summary column (**Wght**) displays the number of conflicts per period weighted by the number of sections offered for each course for singletons and doubletons only. This column simply divides the number of potential conflicts for singletons and doubletons by the number of sections and then totals the conflicts for that period. The resulting figure will be displayed in the **Wght** column.

Using the Conflicting Sections drill-down utility

When placing a singleton or doubleton course section, if there are no conflict-free periods, you must make a decision whether the conflict will be accepted, or an attempt

will be made to move the conflicting section. In either case, you must identify the sections that are conflicting to make that decision. The Scheduled Conflicts screen displays the individual sections that make up the total number of conflicts for a target period in the Conflict Summary screen. The students in conflict for a particular section can also be displayed as a subset of that section listing.



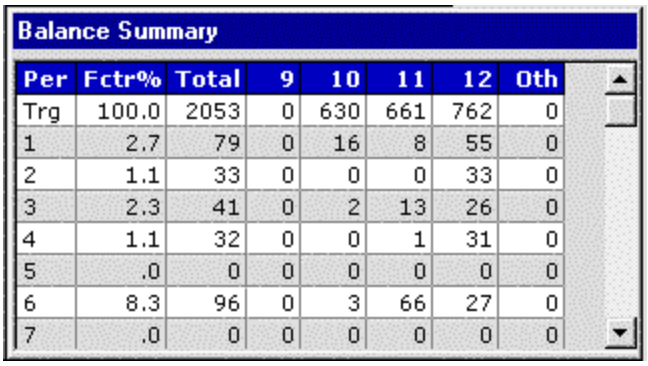
This Scheduled Sections screen is activated by "drilling down" in the Conflict Summary screen. To open it, double click on the cell for the target period in a singleton or doubleton column.

Course sections with requests in conflict will be listed from highest to lowest according to the number of students in conflict (**Cnfl**). Essential section attributes will be listed. In cases of conflicting doubleton courses, where both sections have been placed, section in conflict will be displayed as a primary entry in the listing and the meeting time code of the other placed section will be displayed in the **Partner** field for reference.

To see the students in conflict for a particular section, expand the display by clicking on the plus (+) button to the left of a section entry. Use the minus (-) button to close the student subset. Click **Return** to close the Scheduled Sections screen when finished.

Using the Balance Summary for analysis

Singleton and doubleton class placement is primarily based on conflict avoidance. Overall schedule balance is of little concern when placing singletons and doubletons. Multi-section class placement should be largely driven by schedule balance. The Balance Summary sub-screen comes into play here. Schedule balance means that we have a balance of seats (based on the pre-registration data) across the day for each grade level. This balance is best calculated and monitored by totaling by grade level the virtually scheduled students in a given period. The total by grade level should be relatively close across all periods of the day. A low total would indicate potentially too few sections were offered for that grade level for that period. A high total could indicate too many sections are offered for that grade level for that period.



Balance Summary

Per	Fctr%	Total	9	10	11	12	Oth
Trg	100.0	2053	0	630	661	762	0
1	2.7	79	0	16	8	55	0
2	1.1	33	0	0	0	33	0
3	2.3	41	0	2	13	26	0
4	1.1	32	0	0	1	31	0
5	.0	0	0	0	0	0	0
6	8.3	96	0	3	66	27	0
7	.0	0	0	0	0	0	0

Trg	**Target row.** The first row shows the total number of students pre-registered for all grade levels and for each grade level. Use this as a guide to interpret the balance values in the lines below.
Per	Period
Factr%	This statistic is calculated by using the grade-level proportion of the course to be placed in conjunction with the students (by grade level) who have already been placed ('virtually scheduled') in each period.
Total	Total number of students virtually scheduled per period in all grade levels.
9-10-11-12	Total number of students virtually scheduled in each grade level per period
Oth	Total number of students virtually scheduled in other grade levels combined per period.

To accomplish the best overall master Schedule balance, section placement for multi-section classes should be prioritized by the period that has the lowest total average section size by grade level. These running totals are displayed with the Balance Summary sub-screen. In the process, every attempt should be made to adhere to the following balance rules:

Select Filter Criteria (in Resources sub-screen)

VERY IMPORTANT NOTE: Always Select One Term and One Day in the Cycle with "Overlapping selected" checked "On" for both:

Tallying more than one term or day in the cycle could produce inflated numbers. As an example, if you are a two day cycle and students take one course on day one and another course on day two, the tally for this period will be doubled.

Therefore, always set the Day Filter Criteria to a selected term and day in the cycle, with 'Overlapping Selected' turned on before analyzing the Balance Summary. Unless there is an overriding circumstance, it would probably be best to always set the Day Filter Criteria to the first day in the cycle, and the term to the first term in the school year.

A true reading of master schedule balance would best be accomplished by checking the Balance Summary for each and every day in the cycle independently. However, if you have done a good job of dovetailing the alternating day classes, the numbers should be relatively close. The emphasis is on dovetailing and setting the Day Filter Criteria to the first day in the cycle, checking only that day for overall balance.

Make Every Attempt to Place the Section in the Period with the Lowest Number of Students Displayed for the Grade Level Class being Placed:

Multi-section classes are placed in the schedule by grade level to balance one grade at a time. If you are placing a senior section (predominant grade in course request count), you can primarily check the senior tally on the Balance Summary screen. There may be juniors and sophomores in the class being placed, though we concern ourselves primarily with balancing one grade level at a time, you can use the weighted balance column to give you a weighted (by grade level ratio) balance indicator. Again you are looking for the low number. Junior multi-section classes will be placed after senior classes, and will further correct junior balance at that time, and so on with lower grade level classes.

Never Place Two Sections of a Course During the Same Time Slot:

It is not good practice to schedule two sections of a course meeting at the same time unless there are overriding circumstances. For example:

- The classes in question will be team taught
- There are more sections of the course than periods of the day

Every attempt should be made to place the first section of a multi-section course in the period with the lowest total, the second in the second lowest, and so forth. Even though the lowest period might be three of four sections worth of students lower than the second lowest, don't double up unless absolutely necessary.

Skip a Period if Placement Doesn't Happen Easily:

If you are early in multi-section placement for a grade level and the teacher or room is already scheduled in the preferred period, skip that period and go to the next lowest period. It is best to never move a singleton or doubleton to place a multi-section course for balance purposes. However, if you feel you must, go back and follow the singleton/doubleton placement rules. If there are no conflicts, they can be moved.

If you have only a few courses left to place for the current grade level, and drastic imbalance still appears, you may need to move other sections to make the current section fit.

Use the Factor Percentage

The Balance Summary grid calculates a statistic (called the 'factor percentage') that indicates to the user where best to place a section of a multi-section course that is a crossover. Each time you select a course for placement, the **Fctr%** statistic changes. This statistic is calculated using the grade-level proportion of students who have already been placed ('virtually scheduled') in each period and the grade-level proportion of students who have a request for the selected course. The **Fctr%** statistic calculates proportions by grade level, thus weighting the statistic that is displayed in the grid. For the maximum positive balance impact on the master schedule, the section should be placed in the period where the factor percentage is the lowest.

Exporting A Master Schedule

Master schedules stored in the Master Builder are only working versions of schedules. When a suitable schedule is designed for the target future track you must export that schedule to the Master Schedule application. It will then become the 'active' master schedule for that track so that students can be scheduled, or 'loaded', into it using the various other scheduling applications.

Discussion

There is no tie between the master schedule you will be loading and the master schedule you just created using the Master Schedule Builder Assistant (other than the fact that you did export it from the Builder). Once it is exported, there is no tie between the two. Therefore, if you make a change in the master schedule and you think you might want to go back to the Builder, you must either:

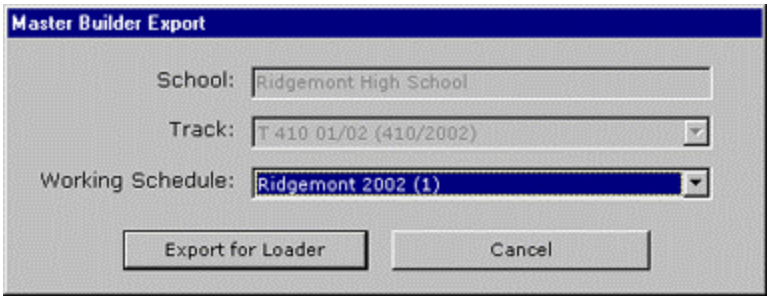
1. Make the same change in the Builder, or
2. Re-import the master you previously exported.

In a high school setting, I would build the master schedule via the Master Schedule Builder Assistant without faculty or rooms. This would assure I built the schedule based on conflict resolution and balance. I would export the master, load and evaluate the results, make changes in the Builder Assistant, re-export, etc. I would stay in this cycle until I felt I had the best possible master schedule. I would then have the department heads staff the schedule. I would use the Builder Assistant to enter teachers and room (much faster than Master Schedule Editor), re-export, and reload as my final loud.

Export Steps:

When you export a master schedule from the Builder Assistant into the Master Schedule Editor, the old master schedule and all associated student schedules will be deleted. Therefore, make sure you are exporting into the proper track. The Export application will not delete a schedule where student attendance has been taken.

1. Log on to the school and track that is to receive the new schedule.
2. Launch the Master Builder and click on the **Export Master Schedule** link on the main menu.
3. In the Master Builder Export dialog that appears, select the name of the working schedule to export.



4. Execute the export by clicking on the Export for Loader command button (or Cancel to abort)

5. The exporting will take a minute or so followed by a confirmation message when it is finished.
6. Click OK on the confirmation message to conclude the export process.

Important follow up procedures

1. **Run Student Loader**
   Run the Student Schedule Loader application against the new master schedule. If necessary, modify the master schedule, re-export, and re-run the Loader until a satisfactory result is achieved.
2. **Set section links (if applicable)**
   If you plan on using section linking when scheduling students, remember that the Student Schedule Loader expects to see only the root course for linked sections. After the last Loader run in the previous step, build the 'child' course sections by manually creating the sections links in the Section Linking application. See documentation on 'Scheduling/Section Linking' for instructions on editing course links.
3. **Pre-schedule students (if applicable) and re-run Loader for last time**
   Any students who need to be pre-scheduled (such as Special Education students, etc.) should be manually pre-scheduled at this time using the Student Schedule Editor application.
4. **Re-run the Loader for the last time.**
5. **Edit course section attributes**
   After the final run of the Student Schedule loader you may need to do some editing of course section attributes. Be aware that the exported master schedule set (or didn't set) the following information in ALL SECTIONS when it created the master schedule, as follows:

Section Attribute	Default Status on Export
Assign Grades	On
Post to History	On
Variable Credit	Off
Scan Gradebook	On
Scan Report Card	On
Scan Progress Reports	On
Flag 1	Off
Flag 2	Off
Take Attendance	On
Count Attendance	On
Scan Attendance	On
Is Homeroom	Off
Mark Definition	Unset

Review the course sections in the finalized master schedule. If any of these settings are incorrect, edit them for correctness. See the documentation on ‘Scheduling/The Master Schedule Editor’ for instructions on editing course section attributes.

Note: Each time a master schedule is exported from the Master Builder the course section attributes are reset to their defaults. Therefore, editing of course section attributes should only be done after the final export of a master schedule.

Glossary of terms

Constraint:
A constraint is situation that forces you to place a section(s) of a course at a specific time. Most constraints are faculty or facility based. A few examples are:

1. You have a part time band teacher that is given to your school only period 1. Therefore, you must teach band period 1.
2. Advance Photo must be taught in a shared facility where you have access only from 2:00 – 3:00 in the afternoon.

Allowing requests (faculty or others) to be treated as constraints can cause total chaos in a master schedule. Limit the number of requests that turn into constraints. A teacher who has a hard time getting up in the morning is not a constraint.

Singleton:
A singleton course is a course that has only once section. A grade-level singleton (senior singleton, junior singleton, etc.) is a singleton with *any* course requests from that grade.

Doubleton:
A doubleton course is a course that has only two sections. A grade-level doubleton (senior singleton, junior singleton, etc.) is a singleton with *any* course requests from that grade.

Multi-Section:
For the sake of this manual, a multi-section course is a course with 3 or more sections. A grade-level multi-section (senior multi-section, junior multi-section, etc.) is a multi-section course with the *majority* of course requests from that grade.

Dovetailing:
There are two scenarios covered by the use of this term when referring to master schedule building. The first use refers to courses that meet in opposite terms (semesters, for example) and must contain common students. The second use indicates courses that meet on alternating days during the same term.

Virtually Scheduled:
This term is used to refer to student requests for which space has been allocated in the master schedule. Each section of a course that is placed in the master schedule claims a portion of the seats available during the period in which it is placed. The Balance Summary grid displays the current totals of virtually scheduled students by grade level, for every period. As each section is placed, the numbers in this grid are updated to reflect that section's placement in the master schedule.

Crossover class:
Courses that have course requests from students from more than one grade level.

Overview of Steps – Flowchart